

**PROPOSED NGWADINI WEIR AND ABSTRACTION
WORKS, PIPELINE AND ACCESS ROAD, LOWER
UMKHOMAZI BULK WATER SUPPLY SCHEME,
KWAZULU-NATAL**

Phase 1 Heritage Impact Assessment

October 2017

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EXECUTIVE SUMMARY

The current water resources supplying the south coast of KwaZulu-Natal are insufficient to meet the projected water demands. The Lower uMkhomazi Bulk Water Supply System (LUBWSS) is the recommended augmentation option for the existing upper and middle south coast supply area, which is currently supplied by water from local rivers and dams and augmented by the Mgeni system. The planned supply area to be augmented are the coastal areas of eThekweni and Ugu Municipalities from Amanzimtoti to Hibberdene connected to the south coast pipeline. The LUBWSS includes the construction of the Ngwadini off-channel storage (OCS) dam that will be filled through the Ngwadini weir and abstraction works. Water from the uMkhomzai River will be pumped to the Ngwadini Dam during summer periods of excess flow.

This report serves as the Phase 1 Heritage Impact Assessment (HIA) for the Ngwadini weir and abstraction works, as well as the associated pipeline and access road.

The proposed pipeline and access road are longer than 300m hence the development triggers section 38 (1) (a) of the National Heritage Resources Act (Act No. 25 of 1999) that lists developments that may require a HIA. This subsection refers to the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length. There are two alternatives (options) for the configuration of the proposed weir and abstraction works which were assessed.

The Ngwadini project components are located within the Umdoni Local Municipality and the Ugu District Municipality, in the eThekweni Metropolitan Municipality. The study area traverses land under Ingonyama Trust. The project area is approximately 20km north-west of Scottburgh.

A site inspection was undertaken on 29 August 2017. Site conditions were poor as much of the area is thickly overgrown with vegetation including sickle-bush. Access was difficult and identification of heritage sites, especially low-lying heritage resources was very difficult. The specialist was assisted by two local residents, Mr B. Latha and Mr Z.E. Ngcobo. They pointed out grave sites in the immediate and surrounding area.

The site of the proposed weir and abstraction works, on the southern bank of the uMkhomazi River was inspected as well as the area adjacent to this site. No heritage sites were found. In a more open area with an existing gravel track and cattle path, an abandoned house close to the remains of another structure was located. Close to the abandoned house, a potential grave site was found with a border made of rocks roughly cemented together. It appears to be a single grave and is situated about 12m east of the proposed access road and on the outer edge of the buffer

area demarcated for the road. The abandoned house is located 10m east of the buffer area for the road. The remains of the structure referred to fall within the access road. It was made from soil with white-washed walls. South-west of the proposed dam wall and falling within the buffer of the proposed access road is the grave of a member of the Mbele clan. The grave is not visible as it is heavily overgrown with vegetation and has no headstone or other marker

The South African Fossil Sensitivity Map indicates that the project area falls mainly into an area of insignificant / zero fossil sensitivity with an overlap into an area of low fossil sensitivity. An area of insignificant / zero fossil sensitivity requires no palaeontological study; an area of low fossil sensitivity also does not require further study but does require a protocol for chance fossil finds which is included in Chapter 12 of this report.

Two grave sites were found during the site inspection. Due to the very thick vegetation making access difficult to almost impossible in some sections, it is possible that other graves and remains of structures were not found during the site inspection. Many graves were pointed out in the proposed Ngwadini Dam site hence it is likely that more graves may be found along the proposed route for the pipeline and access road. It is therefore recommended that a Phase 2 HIA is undertaken when the area for the access road and pipeline area are cleared of vegetation to allow access to the areas.

It is strongly recommended that graves are not moved and where possible, the route for infrastructure (pipelines and roads) is adjusted to avoid such sites. Graves are highly significant to many people and there are many traditional, cultural and personal sensitivities concerning the removal of graves. If the decision is taken to relocate the graves, the legal and regulatory requirements as provided in this report must be adhered to.

Although the structures found during the Phase 1 inspection are of low significance, it is recommended that application be made to Amafa, in terms of section 33 (1) (a) of the KZN Heritage Act, that states that no structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Amafa Council.

The assessment of the two options indicates that due to the larger size of the option 2 it could have a higher impact on heritage resources than option 1, therefore, from a heritage perspective, option 1 is the preferred option for the proposed weir and abstraction works.

The proposed Ngwadini abstraction works and weir and associated pipeline and access road impacts on a number of graves and abandoned and dilapidated structures. It is the specialist's recommendation that the alignment / route of the infrastructure is amended to avoid impacting on them. It is not recommended that the graves are relocated. In addition, it is recommended that a Phase 2 HIA is undertaken when the pipeline route and access road are cleared of vegetation in order that the presence (or not) of heritage resources, including graves, is confirmed.

In conclusion, from a heritage perspective, the construction of the abstraction works and weir (option 1), and associated pipeline and access road can proceed as long as the recommendations and the mitigation measures provided in the report are adhered to and implemented.

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AUTHOR DETAILS

Name	Qualifications	Professional Registration
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1. INTRODUCTION

The current water resources supplying the south coast of KwaZulu-Natal are insufficient to meet the projected water demands. The Lower uMkhomazi Bulk Water Supply System (LUBWSS) is the recommended augmentation option for the existing upper and middle south coast supply area, which is currently supplied by water from local rivers and dams and augmented by the Mgeni system. The planned supply area to be augmented by the LUBWSS are the coastal areas of eThekweni and Ugu Municipalities from Amanzimtoti to Hibberdene connected to the south coast pipeline (Nemai 2017:1).

The LUBWSS includes the construction of the Ngwadini off-channel storage (OCS) dam that will be filled through the Ngwadini weir and abstraction works. Water from the uMkhomzai River will be pumped to the Ngwadini Dam during summer periods of excess flow.

Nemai Consulting (Nemai) was appointed by Umgeni Water as the Environmental Assessment Practitioner (EAP) to undertake a Basic Assessment (BA) process for the Ngwadini weir and abstraction works as well as the associated pipeline and access road. In turn, JLB Consulting was appointed by Nemai to undertake a Phase 1 Heritage Impact Assessment (HIA) of the proposed project. This report serves as the Phase 1 HIA report for the project.

2. LEGISLATIVE BACKGROUND

The proposed pipeline and access road are longer than 300 m hence the development triggers section 38 (1) (a) of the National Heritage Resources Act (Act No. 25 of 1999) that lists developments that may require a HIA. This subsection refers to the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length. The footprint of the two options / configurations for the abstraction works and weir are less than 5000 m².

In addition, the construction of the abstraction works, weir, pipeline and access road could impact on graves, protected structures, archaeological and palaeontological resources that are protected in terms of sections 34, 35, and 36 of the National Heritage Resources Act (NHRA).

In terms of Section 3 of the NHRA, heritage resources are described as follows:

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;

- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including—
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves of victims of conflict;
 - (iv) graves of individuals designated by the Minister by notice in the *Gazette*;
 - (v) historical graves and cemeteries; and
 - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including:
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage;
 - (iii) ethnographic art and objects;
 - (iv) military objects;
 - (v) objects of decorative or fine art;
 - (vi) objects of scientific or technological interest; and
 - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

This Phase I HIA is undertaken to assess whether any heritage resources will be impacted by the proposed Ngwadini weir, abstraction works, pipeline and access road.

3. LOCATION

The Ngwadini project components are located within the Umdoni Local Municipality and the Ugu District Municipality, in the eThekweni Metropolitan Municipality. The study area traverses land under Ingonyama Trust. The project area is approximately 20km north-west of Scottburgh. The weir and abstraction works will be built on the uMkhomzai River (see **Figures 1 and 2** below). The proposed project is located in a rural landscape with deep valleys and thick vegetation interspersed with homesteads.

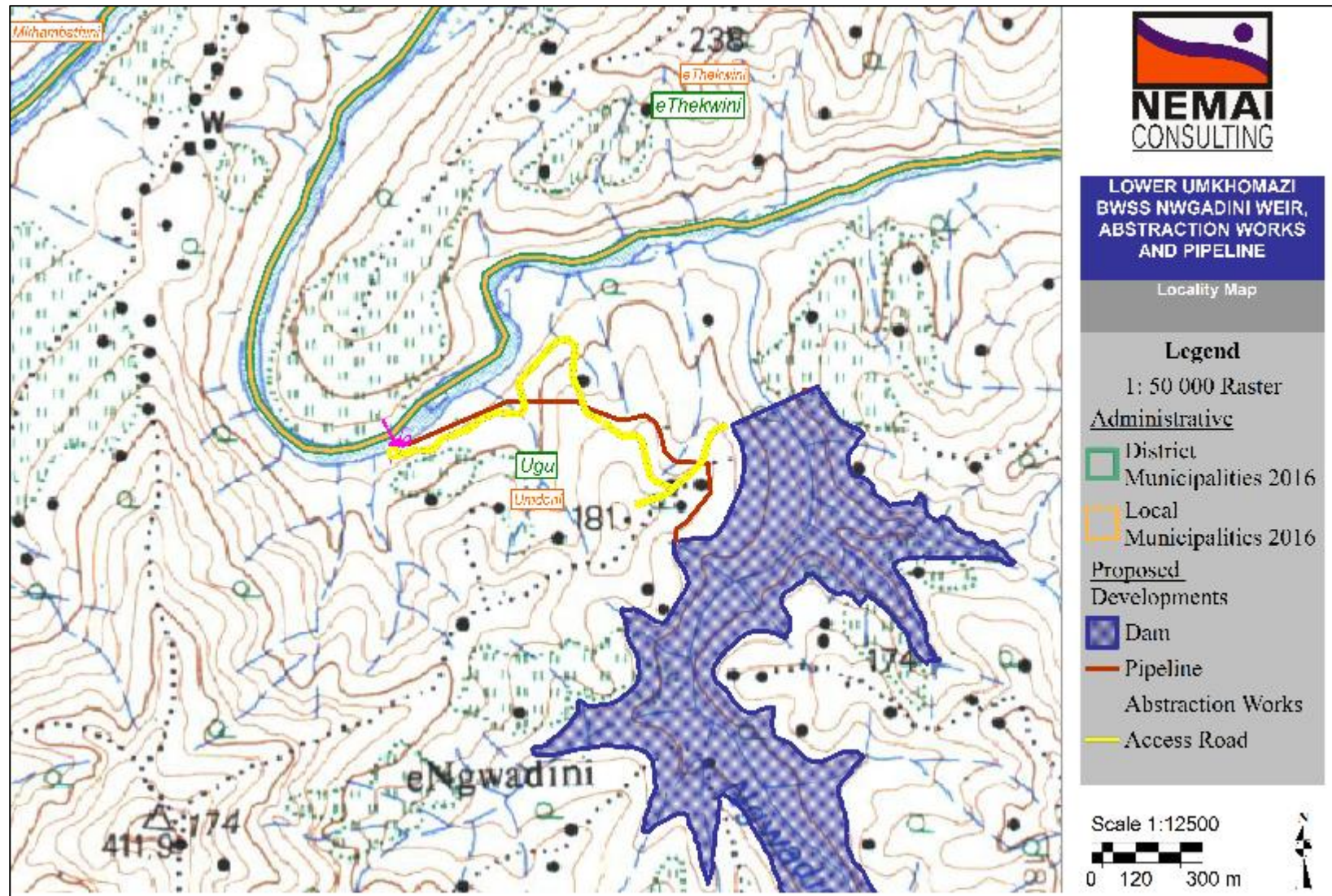


Figure 1: Locality map

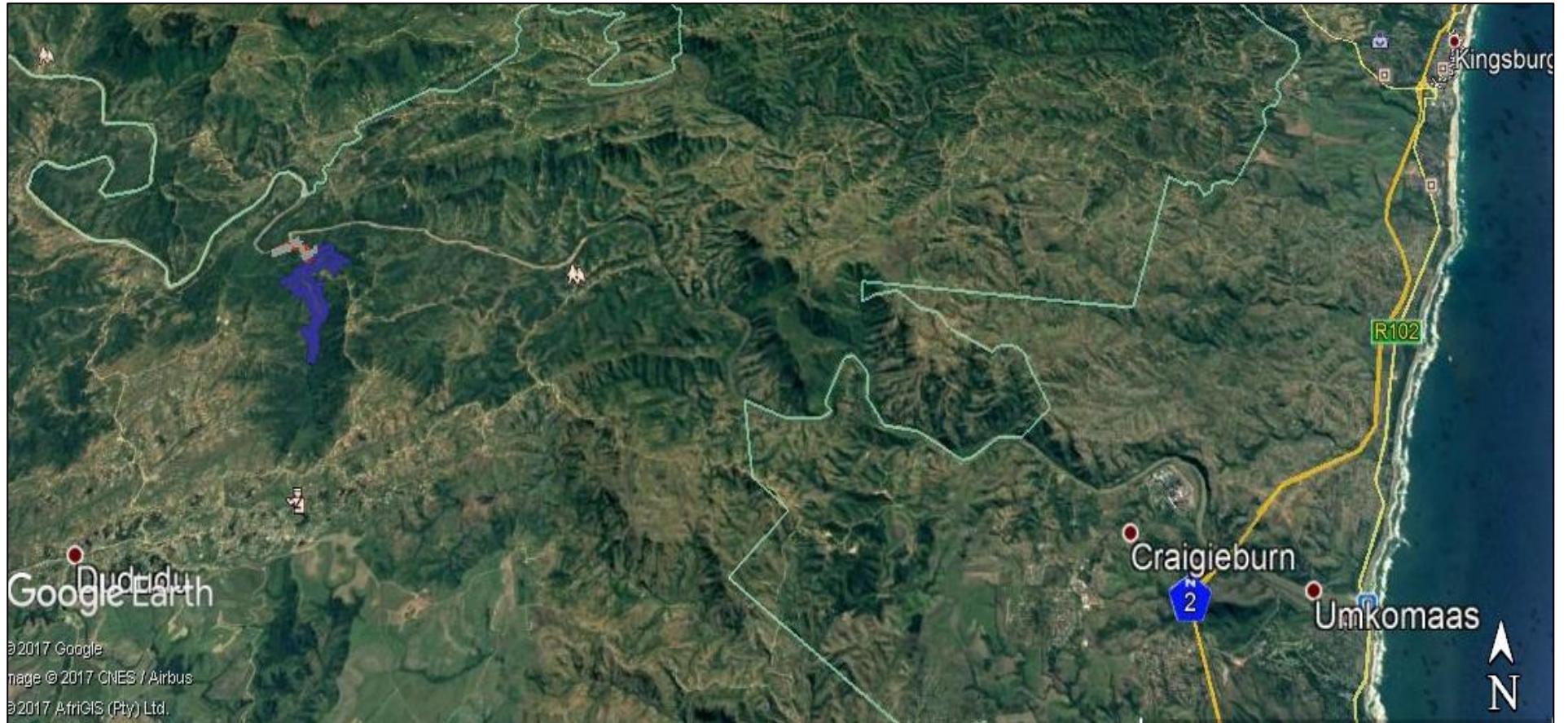


Figure 2: Project within wider environment

4. PROJECT SCOPE

In terms of the scope of works provided by Nemaï (2017), the project components that are included in this report are the following:

- Ngwadini weir;
- Ngwadini abstraction works;
- Pipeline; and
- Access road.

The Ngwadini abstraction works will abstract and pump water from the uMkhomazi River to the Ngwadini OCS Dam on the Ngwadini River. The chosen weir position was upstream of the previous positions considered during investigations and was based on a combination of suitable hydraulic conditions on the outside of a bend, and good topography and geotechnical conditions (Nemaï 2017:2).

The abstraction capacity required for the selected scheme configuration is 1m³/s. However, for the sake of flexibility and future upgrades, the civil infrastructure was designed at 2.6 m³/s; the flow to supply the WTP directly from the dam.

There are two alternatives (options) for the configuration of the proposed weir and abstraction works. See **Figures 3 and 4** below:

- Option 1: Abstraction works with weir and hopper(s). The size of this option is:
 - Footprint including weir = 975 m²
 - Footprint excluding weir = 250 m²

- Option 2: Abstraction works with weir and pump canals. The size of this option is:
 - Footprint including weir = 2500 m²
 - Footprint excluding weir = 1150m².



Figure 3: Option 1



Figure 4: Option 2

5. TERMS OF REFERENCE

A description of the services is as follows:

- Undertake a Phase 1 Heritage Impact Assessment in accordance with the South African Heritage Resources Act (Act No. 25 of 1999).
- The identification and mapping of all heritage resources in the area affected, as defined in Section 2 of the National Heritage Resources Act, 1999, including archaeological sites on or close (within 100m) of the proposed development.
- Prepare a heritage sensitivity map (GIS-based), based on the findings of the study. All SHP files must be provided by the Specialist.
- An assessment of the significance of such resources in terms of the Heritage Assessment Criteria as set out in the regulations.
- An assessment of the impact of the development on such heritage resources.
- Include alternatives considered and make a recommendation as to which option the Specialist prefers. The alternatives section of the HIA may have to be updated as alternative options may change after Public and Authority comment is received.
- Identify heritage resources to be monitored.
- Comply with specific requirements and guidelines of SAHRA and the KZN Heritage Resource Authority – Amafa aKwaZulu-Natali (Amafa).
- The Specialist must update the HIA after Public and Authority comments are received (if necessary), as well as after clients comments.
- All specialist reports must adhere to Appendix 6 (“specialist reports”) of GN No. R. 982 (04 December 2014, as amended)

6. METHODOLOGY AND SITE CONDITIONS

A survey of literature, including previous HIAs done in the surrounding area, was undertaken in order to gain an understanding of potential heritage resources along and in close proximity to the proposed project.

A site inspection was undertaken on 29 August 2017. Site conditions were poor as much of the area is thickly overgrown with vegetation including sickle-bush. Access was difficult and identification of heritage sites, especially low-lying heritage resources (such as archaeological sites and graves), was very difficult.

The specialist was assisted by two local residents, Mr B. Latha and Mr Z.E. Ngcobo. They pointed out grave sites in the immediate and surrounding area to the specialist.

The EAP will upload the HIA report onto the SAHRIS database in order that Amafa can assess and comment on the report.

7. HISTORICAL BACKGROUND OF THE STUDY AREA

An archaeological survey of the proposed Ngwadini Dam was undertaken by Anderson (1997) and his analysis indicated that no previous archaeological surveys had been undertaken in the area, nor were there any known archaeological sites in this area. It was suggested that archaeological sites may exist in the affected dam area, since it is located near a main water source (the uMkhomzai River) (Anderson: 1). During the Anderson survey, no archaeological sites were recorded in the affected area. The only artefacts we observed were a few Middle Stone Age stone tools that are common in KwaZulu-Natal and were assessed to be of low archaeological significance (Anderson: 2).

Dududu is the closest village to the project area. It is a small rural area that was established in 1932. It is also referred to as Zembeni by local inhabitants. The area is primarily used for agriculture such as the sugarcane plantations owned by the Illovo Sugar company. Dududu lies at the edge of a massive rock known as Tshenkombo, a name derived from Zulu words *etsheni laNkombo*, which translate to Nkombo's rock. Previous inhabitants believed Nkombo was a giant snake that resided under the rock (Wikipedia 2017:2).

Dududu became infamous during the political battles that occurred after the country's first democratic elections in 1994 due to the rivalry between the Inkatha Freedom Party and African National Congress to govern the country (Wikipedia 2017:1).

In 2015, Dududu was in the news again. A sangoma had visions that sparked an investigation into the mystery of hundreds of bodies buried on a Dududu farm. The sangoma, Bongekile Nonhlanhla "Mshanelo" Nkomo, accompanied by a chaplain from the Pietermaritzburg prison, a friend and her student sangoma went to Glenroy Farm in Dududu. The farm was known for using prison labour from the 1960s to the 1980s.

8. SITE INSPECTION RESULTS

The site of the proposed weir and abstraction works was inspected. It will be situated on the southern bank of the uMkhomazi River. The area and rocks along the river bank (see **Figures 5 and 6** below) were inspected for any visible fossils but none were found. The area adjacent to the location of the works was inspected and no heritage sites were found.

Where possible, the proposed pipeline and access road alignments were inspected. This was difficult as large sections of both alignments were covered with very thick vegetation which made access very difficult (see **Figures 7-8** below). Only those sections of the road and pipeline that were relatively clear and accessible were inspected.



Figure 5: Site of abstraction works



Figure 6: Abstraction works looking up river



Figure 7: Vegetation along access road / pipeline



Figure 8: View of section of road alignment

In a more open area with an existing gravel track and cattle path, an abandoned house close to the remains of another structure were found. Close to the abandoned house, a potential grave site was found. It has a border made of rocks roughly cemented together and appears to be a single grave. It is located at 30°08'05.4"S 30°35'55.7"E and is situated about 12m east of the proposed access road and on the outer edge of the buffer area demarcated for the road (see **Figure 9** below). The abandoned house is located 10m east of the buffer area of the road.



Figure 9: Possible grave site with abandoned house in background



Figure 10: Google Earth image showing heritage sites

The remains of the structure (shown in **Figure 11** below) fall within the access road and is located at 30°08'06.0"S 30°35'55.0"E. The structure was made from soil with white-washed walls. A wooden support can still be seen in the photograph below.



Figure 11: Remains of structure

South-west of the proposed dam wall and falling within the buffer of the proposed access road, as seen below, the grave of a member of the Mbele clan was pointed out by Messrs. Latha and Ngcobo. The grave is situated at 30°08'13.1"S 30°36'08.6"E. The grave is not visible as it is heavily overgrown with vegetation and has no headstone or other marker identifying it (see **Figure 12** below).



Figure 12: Mbele grave in relation to access road and dam



Figure 13: Mbele grave

The South African Fossil Sensitivity Map indicates that the project area falls mainly within an area of insignificant / zero fossil sensitivity as indicated by the grey colour on **Figure 14** below. There is overlap into an area of low fossil sensitivity (blue colour). An area of insignificant / zero fossil sensitivity requires no palaeontological study; an area of low fossil sensitivity also does not require palaeontological study but does require a protocol for fossil finds which can be found in Chapter 12 of this report.

9. DISCUSSION OF FINDINGS AND RECOMMENDATIONS

Two grave sites were found during the site inspection. Due to the very thick vegetation making access difficult to almost impossible in some sections, it is possible that other graves and remains of structures were not found during the site inspection. The two local residents pointed out many graves that are located in the proposed Ngwadini Dam hence it is likely that more graves may be found in the project area especially along the proposed route for the pipeline and access road.

It is therefore recommended that a Phase 2 HIA is undertaken when the area for the access road and pipeline area are cleared of vegetation to allow access to them. It is recommended that a heritage specialist with experience with grave relocations should undertake the Phase 2 so that if it is decided that the identified graves and any others found should be moved, then the process can start immediately.

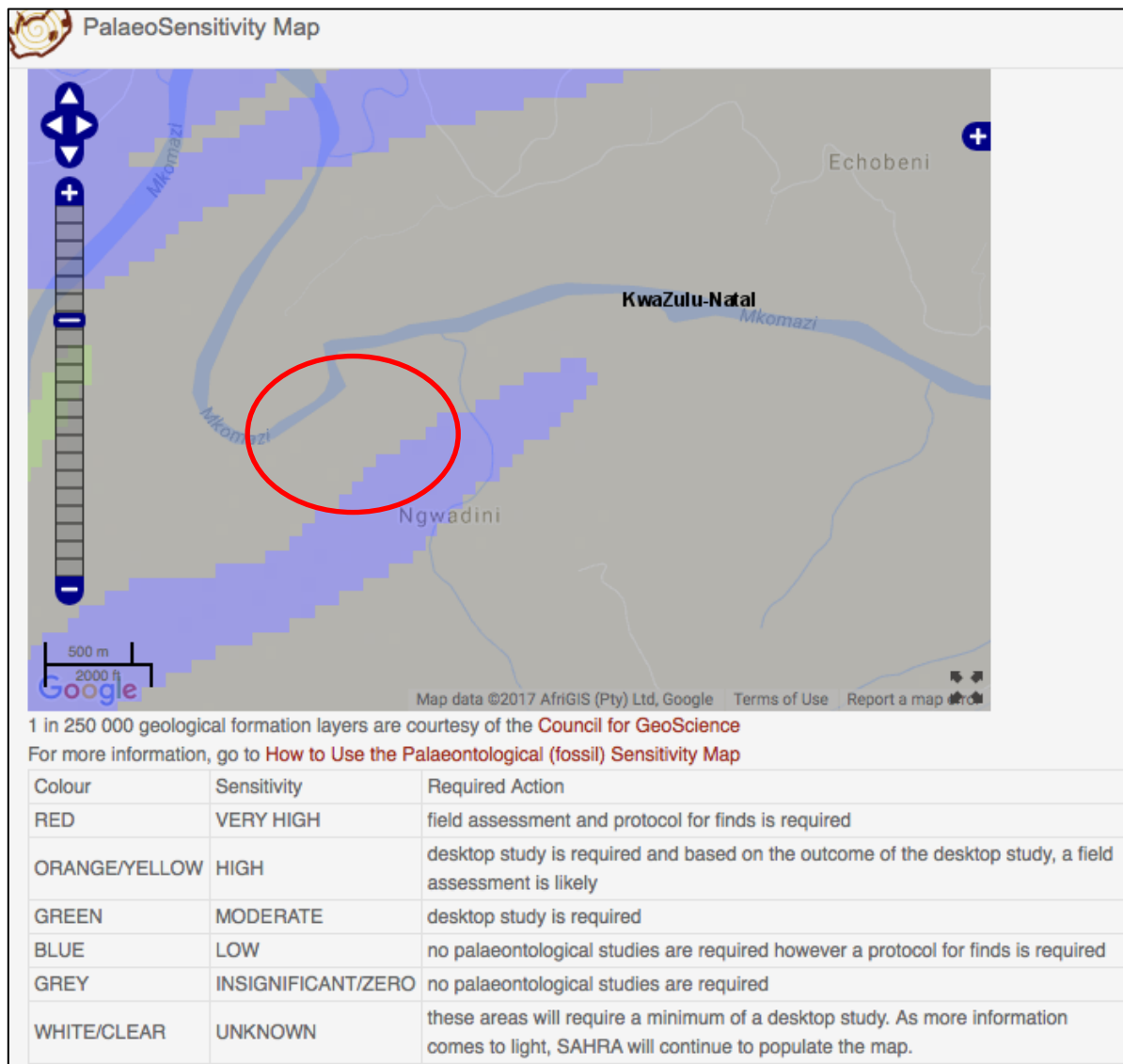


Figure 14: Fossil sensitivity of approximate project area as indicated with red circle

However, it is strongly recommended that graves are not moved and, where possible, the route for infrastructure (pipelines and roads) is adjusted to avoid such sites. Graves are highly significant to many people and there are many traditional, cultural and personal sensitivities concerning the removal of graves.

If the decision is taken to relocate the graves, the following should be noted:

In terms of section 35 of the KZN Heritage Act, which refers to general protection of traditional graves, the following is stated:

- (1) No grave –
 - (a) not otherwise protected by this Act; and
 - (b) not located in a formal cemetery managed or administered by a local authority,

may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Amafa Council having been obtained on written application to the Council; and that

- (2) The Council may only issue written approval once the Council is satisfied that –
- (a) the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
 - (b) the applicant and the relevant communities or individuals have reached agreement regarding the grave.

According to section 3 of the KwaZulu-Natal Heritage Regulations of 2012 (GNR 40 of 2012), the written application must contain the following information according to subsection (2):

- (a) the names and qualifications of the applicant;
- (b) the identification of the grave or cemetery to be damaged, altered, exhumed, or removed from its original position; .
- (c) the purpose of such damage, alteration, exhumation or removal from its original position;
- (d) the location of such grave or cemetery;
- (e) the municipal area within which the location of such grave or cemetery is situated; and
- (f) particulars of bodies or interest groups consulted by the applicant.

In terms of subsection (5) (1) of regulation 3, the Council must ensure that the applicant has instituted a process of consultation with the relevant community or municipality; and in terms of sub-section (6), if the Council decides to grant the approval, notice of approval must be made in the Gazette. It should be noted that the gazetting of the notice is at the cost of the Applicant.

In terms of subsection (13), approval may only be granted -

- (a) where the work to be carried out is to be done under the supervision of a qualified archaeologist or person approved by the Council;
- (b) with due respect for any human remains and the customs and beliefs of any person or community concerned with such grave or burial ground; and
- (c) after arrangements have been made for the re-interment, if necessary, of any human remains and the re-interment or curation of any other contents of such grave or burial ground, to the satisfaction of the Council and the community involved.

The age of the abandoned dwelling and dilapidated remains of a structure found close to the first grave site could not be ascertained. Both structures are common in the area and therefore have a low significance and can therefore be demolished if necessary. Applying the precautionary principle, it is recommended that if the structures are to be demolished, then application be made

to Amafa for permission to do so. According to section 33 (1) (a) of the KZN Heritage Act, no structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Amafa Council having been obtained on written application to the Council.

If the graves and structures are left *in situ*, then a 10m cordon / buffer must be placed around them to prevent any damage to them during the construction and operation of the access road and pipeline.

10. WEIR & ABSTRACTION WORKS CONFIGURATION OPTIONS ASSESSMENT AND SELECTION

The impact assessment of the two configuration options for the weir and abstraction works focuses on the direct and indirect impacts to heritage resources associated with the project. All impacts have been analysed with regard to their nature, extent, magnitude, duration, probability and significance as described below:

Nature (/Status)

The project could have a positive, negative or neutral impact on the environment.

Extent

- Local - extend to the site and its immediate surroundings.
- Regional - impact on the region but within the province.
- National - impact on an interprovincial scale.
- International - impact outside of South Africa.

Magnitude

Degree to which impact may cause irreplaceable loss of resources.

- Low - natural and social functions and processes are not affected or minimally affected.
- Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration

- Short term - 0-5 years.
- Medium term - 5-11 years.
- Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability

- Almost certain - the event is expected to occur in most circumstances.
- Likely - the event will probably occur in most circumstances.
- Moderate - the event should occur at some time.
- Unlikely - the event could occur at some time.
- Rare/Remote - the event may occur only in exceptional circumstances.

Significance

Provides an overall impression of an impact's importance and degree to which it can be mitigated.

- 0 – Impact will not affect the environment. No mitigation necessary.
- 1 – No impact after mitigation.
- 2 – Residual impact after mitigation.
- 3 – Impact cannot be mitigated.

Table 1: Assessment of configuration 1

Configuration option 1		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Low	Low
Probability	Unlikely	Rare / remote
Status	Negative	Negative
Reversibility	No	No
Level of Significance	2 – if mitigation measures are not implemented	1 – no impact with implementation of mitigation measures
Can impacts be mitigated	Yes	
Mitigation		
<ul style="list-style-type: none"> • If, during excavation for and construction of the weir and abstraction works, there are chance finds of heritage resources (for example, graves, fossils) then work must stop immediately and a heritage specialist called to site to inspect the find and decide the way forward. No work may be undertaken until the heritage specialist allows this. • If any heritage resources are to be altered, removed or destroyed, then the correct permits must be obtained from Amafa prior to any action been undertaken. 		

Table 2: Assessment of configuration 2

Configuration option 2		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Low	Low
Probability	Moderate	Unlikely
Status	Negative	Negative
Reversibility	No	No
Level of Significance	2 – if mitigation measures are not implemented	1 – no impact after mitigation

Can impacts be mitigated	Yes	
Mitigation		
<ul style="list-style-type: none"> • If, during excavation for and construction of the weir and abstraction works, there are chance finds of heritage resources (for example, graves, fossils) then work must stop immediately and a heritage specialist called to site to inspect the find and decide the way forward. No work may be undertaken until the heritage specialist allows this. • If any heritage resources are to be altered, removed or destroyed, then the correct permits must be obtained from Amafa prior to any action been undertaken 		

The assessment of the two options indicates that due to the larger size of the option 2 it could have a higher impact on heritage resources (if any) than option 1 - the larger the size of the development the greater the risk of a development impacting on heritage resources. Therefore, from a heritage perspective, option 1 is the preferred option for the proposed weir and abstraction works.

11. CONCLUSION

The proposed Ngwadini abstraction works and weir and associated pipeline and access road impacts on a number of graves and abandoned and dilapidated structures. It is the specialist’s recommendation that the alignment / route of the infrastructure that will impact on these sites should be amended to avoid impacting on them. It is not recommended that the graves are relocated.

In addition, it is recommended that a Phase 2 HIA is undertaken when the pipeline route and access road are cleared of vegetation in order that the presence (or not) of heritage resources, including graves, is confirmed. Currently, thick, inaccessible undergrowth obscures such resources (if any).

It is recommended that option 1 for the proposed weir and abstraction works is used.

In conclusion, from a heritage perspective, the construction of the abstraction works, weir, and associated pipeline and access road can proceed as long as the recommendations provided in Chapter 9, as well as in Tables 1 – 2 are implemented. In addition, the mitigation measures provided below must also be adhered to and implemented where necessary.

12. MITIGATION MEASURES

- For any chance finds of heritage resources, all work must cease in the area affected and the Contractor will immediately inform the Project Manager. A registered heritage specialist / palaeontologist must be called to site for inspection. Amafa must be informed about any finds.
- The heritage specialist will assess the significance of the heritage resource/s found and provide guidance on the way forward.
- Permits must be obtained from Amafa if heritage resources are to be removed, destroyed or altered.
- The following monitoring procedure should be followed in terms of chance fossil finds:
 - When excavations begin the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, and coal) should be put aside in a suitably protected place. This way the construction activities will not be interrupted.
 - Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
 - Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
 - A qualified palaeontologist should visit the site to inspect the selected material and check the dumps where feasible. The frequency of inspections should be dependent on the finding of any potentially important fossil material.
 - Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site an Amafa and/or SAHRA permit must be obtained. Annual reports must be submitted to Amafa and SAHRA as required by the relevant permits.
 - If no fossils are found and the excavations have finished then no further monitoring is required.
- All heritage resources found close to the construction area must be protected by a 10m buffer in which no construction can take place. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.

- Should any remains be found on site that is potentially human remains, the South African Police Service (SAPS) should also be contacted. Members of the SAPS may not remove remains until the necessary permits have been obtained.

13. REFERENCES

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